Trip Report

Collection of Coral and Conch Tissues within the St. Thomas East End Reserves (STEER), USVI
Project in partnership with the U.S. Virgin Islands Department of Planning and Natural Resources, The Nature Conservancy, and the University of the Virgin Islands

17 June – 25 June 2012

Mission Purpose:

The 2012 field mission in the STEER was in support of Year 2 for the project: *Characterization of Land-Based Sources of Pollution and Effects in the St. Thomas East End Reserve (STEER)*. The overall goals of the field mission were to conduct a biological survey of the marine resources within the STEER, and to collect samples of coral and conch for chemical contaminant analysis. The Biogeography Branch of NCCOS' Center for Coastal Monitoring and Assessment (CCMA) conducted the biological survey, and CCMA's Coastal Oceanographic Assessment Status and Trends (COAST) Branch conducted the collection of coral and conch tissue for chemical contaminant analysis. This trip report provides a summary of activities by COAST to collect coral and conch tissues for chemical contaminant analysis, along with the personnel involved (personnel list at the end of this document). A separate trip report provides a summary of the biological survey. The goal of the COAST work was twofold: (1) collect coral tissue samples to analyze for chemical contaminants and histology, and (2) collect conch tissue samples to analyze for chemical contaminants.

Background:

NCCOS' CCMA is working closely with a number of divisions in the USVI DPNR (e.g., Divisions of Fish and Wildlife, Coastal Zone Management, and Environmental Protection), the University of the Virgin Islands (UVI), and The Nature Conservancy to develop a baseline characterization of chemical contamination, toxicity, and marine resources in the St. Thomas East End Reserves (STEER) in St. Thomas, USVI. The STEER contains extensive mangroves, seagrass beds and coral reefs. Within the watershed, however, are a large active landfill, numerous marinas, various commercial/industrial activities, an EPA Superfund Site, resorts, and several residential areas served by individual septic systems. The baseline assessment will provide managers with critical information needed to help preserve and restore habitats, including a number of nursery areas within the STEER that are important to commercial and recreational fisheries.

In Year 1 of this project, sediments were sampled to assess chemical contamination throughout the Reserves, benthic community condition, and sediment toxicity using a battery of established bioassays. In addition, monthly sampling of sedimentation (using sediment traps), nutrients, and total suspended solids (TSS) began in Fall 2011 in partnership with UVI. Year 2 of the project builds upon this work, providing an assessment of the biological resources within the STEER, including fish and benthic habitats, along with an assessment of chemical contaminants in biota (e.g., fish, corals, and conch). Overall, this work will provide the baseline data requested by STEER managers and will help identify future projects to reduce LBSP (land-based sources of pollution) and help restore and conserve critical habitats.

The primary objectives of the COAST work were to:

1) Collect coral tissue (*Porites astreoides*) samples to analyze for approximately 150 organic (e.g., hydrocarbons and pesticides) and inorganic (e.g., metals) chemical contaminants and histology.
2) Collect conch tissue (*Strombus gigas*) samples to analyze for approximately 150 organic (e.g., hydrocarbons and pesticides) and inorganic (e.g., metals) chemical contaminants.

Coral Tissue Sampling:

Coral tissue samples were collected under DPNR Permit #STT-023-12. There were three components to the coral tissue sampling effort. Coral tissues were collected in separate containers for 1) contaminant analysis, 2) histological analysis, and 3) genetic analysis. Contaminant samples were collected at 8 boat based locations, histopathology at 4, and genetic samples at 1 location by NOAA and project partner SCUBA divers. An additional set of contaminant and histopathology samples were collected via snorkeling inside of Mangrove Lagoon. Sampling personnel were provided with pre-labeled containers in a dive bag for collecting the samples.

A sample location (site) was described as a single dive area with a 50 meter radius where *Porites astreoides* would be available for sampling. A site consisted of at least 1 or up to 5 *P. astreoides* coral heads. The sites where coral and conch were sampled can be seen in Figure 1.

The coring of coral tissues for sampling was done by two methods, one for contaminants and genetics, and one for histopathology.

The following describes how each coral tissue sample was collected:

Contaminants and biomarker: Samples were collected using a 6 inch titanium coring tool. Each sampled tissue plug was approximately 1-1.5 cm deep. If the coral fractured during sampling, pieces were used as sample taking care to avoid large amounts of skeletal material. If plugs became stuck in the titanium coring tube, a Teflon® stir stick was used to dislodge the sample. Stainless steel instruments, including standard non-titanium coring devices, were avoided as they contain metals that could contaminate the samples being collected. A total of nine coral samples were collected for chemical contaminant analysis (Table 1).

Histology: Histology samples were collected using their own specific coring tools. Each coring tool was contained in its own sample jar (Falcon tube). Each core was removed from the Falcon tube on site (at depth – tubes were opened at the surface to allow site water to infiltrate for pressure equalization). Once a core for histology was taken, the tissue sample remained in the coring tool and the whole apparatus (corer with tissue sample inside) was placed back into the Falcon tube.

The following describes what constituted a sample for each component at each site:

Contaminant sample: One full 250ml glass sample jar (approximately 18-20 coral tissue cores). Cores were taken from each available coral head (up to 5) and composited into the one jar.

Histological sample: One core per Falcon tube, two Falcon tubes per coral head. A maximum of 10 Falcon tubes (from 5 coral heads) with corresponding tissue samples per site.

Genetic sample: One to two cores per sample tube.

Conch Tissue Sampling:

Conch were collected under Permit #STT-022-12. Two methods of collection were used for conch. 1) Boat based onboard a Nature Conservancy vessel sampling via SCUBA or snorkeling, and 2) Kayak based sampling via snorkeling only. A total of 10 conch (Table 1) were collected from 5 separate locations, one within each strata identified during Year 1 of the project.

Sample Storage and Shipping:

Samples were immediately placed on ice while in the field and with the exception of the histology samples which were chemically preserved, were then transferred to a freezer at the end of each day. Coral tissue samples for contaminant analysis were shipped frozen to the laboratory for analysis.

Conch were placed in labeled 2 gallon Ziplock™ bags and then placed in a cooler of ice while in the field. At the end of each day they were transferred to a freezer. At the end of the field mission, frozen conch were partially thawed to facilitate tissue removal, weighed and measured, and then placed into 1 liter Teflon jars and refrozen. Once completely frozen, samples were shipped on ice to the laboratory for contaminant analysis.

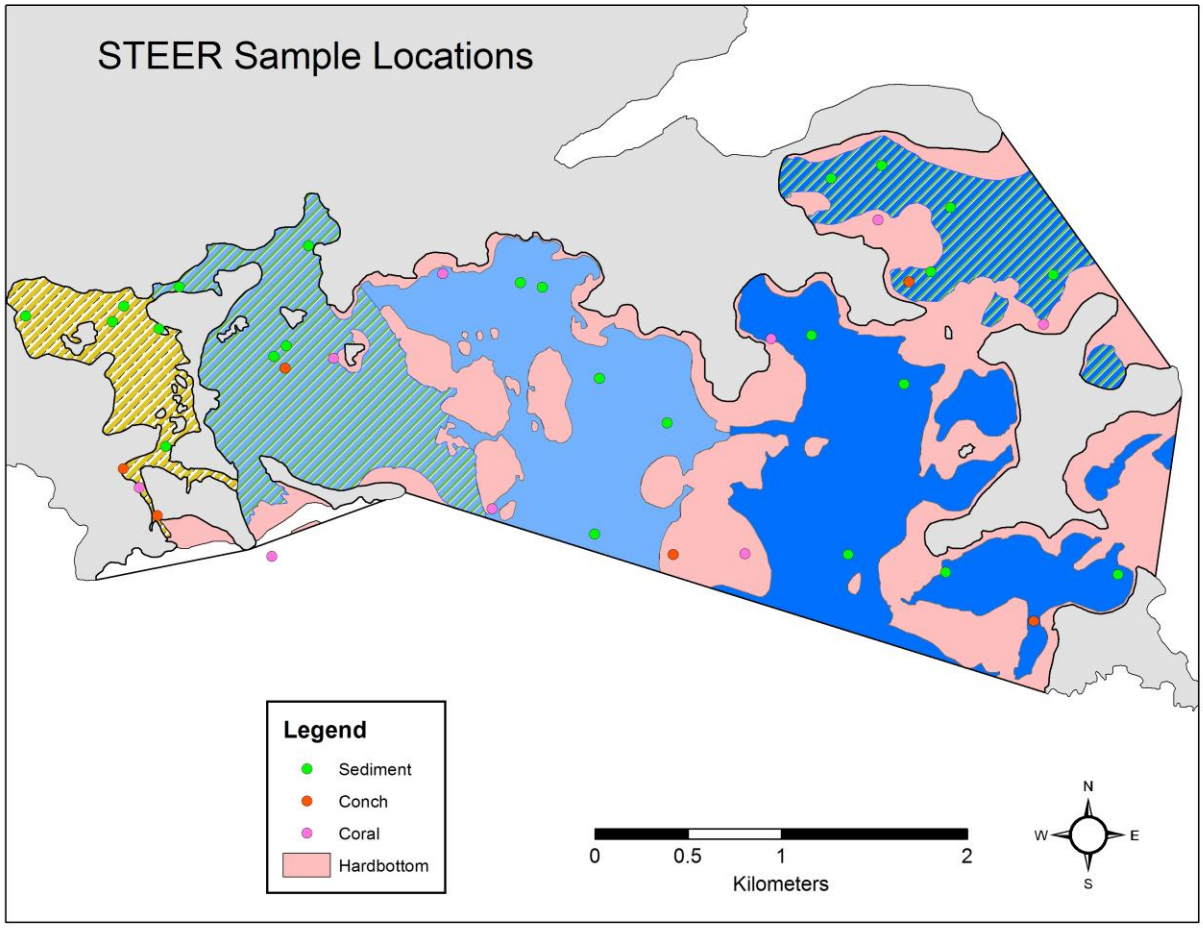

Figure 1. Sediment sample locations (green) are from 2011 mission while conch and coral (red and pink respectively) are from 2012.

Table 1. Collection of coral and conch in the STEER

Sample Type	Number of Sampled Sites	Number of Samples Collected
Coral		
Contaminant	9	9
Histopathology	4	23
Genetic	1	1
Conch	5	10
Total	**14***	**43**

* This number is less than the sum as contaminants and histopathology were often collected at the same site.

Personnel List

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